

SAC
PET
14693

BAAQMD
HEALTH RISK SCREENING ANALYSIS

Target Corporation
450 N. Capitol Avenue
San Jose, CA 95133

21 August 2002

SUMMARY

This document contains the health risk screening assessment prepared for Target Corporation located at 450 N. Capitol Avenue in San Jose, California. The Bay Area Air Quality Management District (BAAQMD), as a routine part of the evaluation of a permit application, prepared this screening risk assessment.

Target Corporation would like to operate a natural gas-fired engine generator at this location. In order to do this, the facility must obtain a permit from BAAQMD. Toxic Air Contaminants (TACs) will be emitted during operation of the engine generator. BAAQMD staff, as a part of the permit review process, evaluates the possible impact of the increase in TAC emissions that will occur with the operation of the engine generator.

The TAC impact is expressed in terms of the increased risk of contracting cancer by individuals who live in the impacted area. The proposed operation would result in a maximum increased risk of 0.019 chances in a million for residential receptors near the facility, and 0.018 chances in a million to nearby commercial/industrial receptor populations. For individuals at the nearby schools, the increased maximum risk is 0.016 chances in a million at Ben Painter Elementary School, and 0.02 chances in a million at William Sheppard Middle School. These results are presented in Table 1.

The screening methods used by BAAQMD to estimate risk are based on a "worst-possible" estimate of the operating conditions for the facility. This type of analysis is considered to be health-protective.

Table 1. Increased Maximum Cancer Risk			
Residential	Commercial/ Industrial	Ben Painter Elementary School	William Sheppard Middle School
0.019 chances in a million	0.018 chances in a million	0.016 chances in a million	0.02 chances in a million

(The estimates of residential risk assume that individuals are continuously exposed over a 70-year lifetime. The estimates of risk at the schools also assume continuous exposure over a 70-year lifetime. Estimates of commercial/industrial risk assume an off-site worker is exposed 8 hours/day, 240 days/year for 46 years.)

School addresses:

Ben Painter Elementary School
500 Rough and Ready Road
San Jose, California 95133

William Sheppard Middle School
480 Rough and Ready Road
San Jose, California 95133

Risk Screening Assessment for Application 5852
Target Corporation, San Jose

Introduction

The BAAQMD Air Toxic Risk Evaluation Procedure and Risk Management Policy (Updated February 3, 2002) states that a written risk screening analysis is to be prepared for any application for a new source of toxic emissions, or for any application for increased toxic emissions from a modified existing source.

II Facility Description

Plant Name:	Target Corporation
Location:	450 N. Capitol Avenue San Jose, CA 95133
Type of Operation:	Natural Gas-Fired Engine Generator
Plant #:	14693
Application #:	5852

III. Exposure Assessment

There are several toxic air contaminants of concern at this facility (see Table 2). The carcinogens include acetaldehyde, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons (PAHs) (including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene). The noncarcinogenic TACs of concern include acrolein, ethylbenzene, naphthalene, toluene and xylene. These TACs are emitted as a result of the operation of natural gas-fired engine generators. The estimated increase in emission rates and annual emissions of TACs that can be expected from this facility are shown in Table 2.

Ambient air concentrations of TACs were predicted using the ISCST3 air dispersion computer model. This model uses information about the facility and the emission rates of toxic air contaminants to estimate concentrations of TACs expected in the air around the site. The estimated increase in maximum concentrations of TACs at residential and commercial/industrial locations near the facility, and at Ben Painter Elementary School and William Sheppard Middle School are presented in Table 3.

IV. Risk Assessment

The estimated concentrations of TACs are used to calculate the possible carcinogenic risks that might be expected to arise from these exposures. The results are presented in Table 4. Risks from exposure to all TACs from the facility, as a result of the natural gas-fired engine generator, are due solely to inhalation exposure, except for benzo(a)anthracene,

Target Corporation
AN #5852
21 August 2002

benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. These PAH compounds are evaluated for multi-pathway exposure.

These potential risk values were calculated using standard risk assessment methodology. They include the assumptions that residents are present in their homes 24 hours/day, 7 days/week for 70-years; off-site workers are present 8 hours/day, 240 days/year for 46 years; and the conservative assumption that the schools are occupied 24 hours/day, 7 days/week for 70 years.

The risk values are based in part on the "best estimates" of plausible cancer potencies as determined by the California Office of Environmental Health Hazard Assessment (OEHHA). The actual value of risk, which cannot be determined, may approach zero.

Table 2. Maximum Increase in Pollutant Emissions

Pollutant	Emission Rate (gm/sec)	Annual Amount (lb/year)	Source of Emission(s)
Acetaldehyde	4.47E-7	3.11E-2	Natural Gas-Fired Engine Generator
Acrolein	4.99E-8	3.47E-3	Natural Gas-Fired Engine Generator
Benzene	1.84E-7	1.28E-2	Natural Gas-Fired Engine Generator
1,3-Butadiene	3.11E-7	2.16E-2	Natural Gas-Fired Engine Generator
Ethylbenzene	6.01E-8	4.18E-3	Natural Gas-Fired Engine Generator
Formaldehyde	3.98E-6	2.77E-1	Natural Gas-Fired Engine Generator
Naphthalene	2.13E-8	1.48E-3	Natural Gas-Fired Engine Generator
Benzo(a)anthracene	4.98E-11	3.46E-6	Natural Gas-Fired Engine Generator
Benzo(b)fluoranthene	3.45E-11	2.40E-6	Natural Gas-Fired Engine Generator
Benzo(k)fluoranthene	6.62E-12	4.60E-7	Natural Gas-Fired Engine Generator
Benzo(a)pyrene	2.29E-12	1.59E-7	Natural Gas-Fired Engine Generator
Chrysene	1.21E-11	8.41E-7	Natural Gas-Fired Engine Generator
Dibenz(a,h)anthracene	2.29E-12	1.59E-7	Natural Gas-Fired Engine Generator
Indeno(1,2,3-cd)pyrene	6.07E-12	4.22E-7	Natural Gas-Fired Engine Generator
Toluene	2.03E-7	1.41E-2	Natural Gas-Fired Engine Generator
Xylene	5.47E-7	3.80E-2	Natural Gas-Fired Engine Generator

Table 3. Annual Average Increase in TAC Concentration in Ambient Air ($\mu\text{g}/\text{m}^3$)				
TACs	Residential	Commercial/ Industrial	Ben Painter Elementary School	William Sheppard Middle School
Acetaldehyde	1.01E-4	1.49E-4	8.69E-5	1.10E-4
Acrolein	1.13E-5	1.66E-5	9.70E-6	1.23E-5
Benzene	4.15E-5	6.13E-5	3.58E-5	4.53E-5
1,3-Butadiene	7.01E-5	1.03E-4	6.04E-5	7.64E-5
Ethylbenzene	1.36E-5	2.00E-5	1.17E-5	1.48E-5
Formaldehyde	8.98E-4	1.33E-3	7.74E-4	9.80E-4
Naphthalene	4.80E-6	7.08E-6	4.14E-6	5.23E-6
Benzo(a)anthracene	1.12E-8	1.66E-8	9.67E-9	1.22E-8
Benzo(b)fluoranthene	7.78E-9	1.15E-8	6.71E-9	8.49E-9
Benzo(k)fluoranthene	1.49E-9	2.20E-9	1.29E-9	1.63E-9
Benzo(a)pyrene	5.16E-10	7.61E-10	4.44E-10	5.62E-10
Chrysene	2.73E-9	4.03E-9	2.35E-9	2.97E-9
Dibenz(a,h)anthracene	5.16E-10	7.61E-10	4.44E-10	5.62E-10
Indeno(1,2,3-cd)pyrene	1.37E-9	2.02E-9	1.18E-9	1.49E-9
Toluene	4.57E-5	6.75E-5	3.94E-5	4.99E-5
Xylene	1.23E-4	1.82E-4	1.06E-4	1.34E-4

Target Corporation
AN #5852
21 August 2002

Table 4. Maximum Increase in Individual Carcinogenic Risk Resulting from Exposure to TACs from Engine Generator Operations

Residential	Commercial/ Industrial	Ben Painter Elementary School	William Sheppard Middle School
0.019 chances in a million	0.018 chances in a million	0.016 chances in a million	0.02 chances in a million